Argonne
NATIONAL LABORATORY

Dear VERITAS VEC:

In this letter, Argonne National Laboratory is applying to change its status from an associate member to a collaborator member within the VERITAS collaboration.

Argonne has been an associate member on VERITAS since April 2004. The Argonne group comprises approximately 2.5 FTE's of physicist and engineering support. These persons are Karen Byrum (.5 FTE - physicist), Liz Hays (.5 ANL postdoc, .5Chicago), Deirdre Horan (1.FTE - postdoc), Bob Wagner (.25 FTE, physicist – will expand to 0.5 FTE in CY07), and Gary Drake (.20 FTE, electrical engineer). Bob's other effort consists of involvement with one of the collider experiments at FNAL, MINOS for CY06 and CDF for CY07. Other effort for Karen consists of .25FTE on the collider experiment CDF and .25FTE on ANL lab management responsibilities. Lab discretionary funds and some HEP DOE base funding have supported our physicists and engineers to date and lab discretionary funds alone have been used to support postdocs. We share one postdoc in a joint appointment with the University of Chicago and we would continue to seek support for joint postdoc appointees in the future.

We believe our effort will remain similar during the next 5 years, although to maintain 1.5 postdocs, DOE must eventually support this effort through its base program. For ANL to receive DOE support, we must assume a lab role in the planned VERITAS upgrade. Argonne technical strengths are in electrical engineering (designing and building triggering and front-end electronics), photo-sensors and mechanical engineering (finite analysis). It is also very possible that we could station a postdoc (or physicist) in Arizona for some extended time in the future.

As mentioned above, our group has been funded mainly with lab discretionary funds. However recently, (Aug 2006) DOE agreed to fund FY07's ANL astrophysics efforts out of base funds. We plan to outline our role in VERITAS operations in our FY07 FWP due next month; these efforts will include taking shifts, leading science efforts and the continued contributions of Liz Hays and Deirdre Horan. In addition, ANL would like to take on a service role in the collaboration such as carrying out offline analysis, assisting with data quality monitoring or performing simulation studies as well as our continued role in R&D for a future VERITAS upgrade. We would also be interested in a hardware role on the present VERITAS-4 array if such were available. One other comment of interest, in August 2006, an Astroparticle group was established within the HEP division at Argonne and Karen Byrum was appointed its group leader.

It would greatly enhance our position and make it easier to secure DOE base funds for physicist and postdoc support by being a stronger member of VERITAS.

Both Deirdre and Liz's position within our group greatly enhance our science involvement. Our science interests are Dark Matter, Gamma-ray bursts, Supernova Remnants and Blazars. Specifically Deirdre, Bob and Karen plan to work closely with Vladimir and the UCLA group on a dark matter analysis. Liz will forge ahead independently (and in collaboration with Simon at Chicago) on SuperNova Remnants. Bob will also join this effort. Deirdre is also a leader in both Gamma-Ray Bursts and Blazar science. ANL has a new postdoc program (supported solely by lab discretionary funds); We hope to add another postdoc to work with Deirdre in either Blazar or Gamma-Ray Bursts science.

As for technical interests, our group is involved with the University of Chicago and the University of Utah in developing an imaging camera using multi-anode PMTs. We are also involved with the University of Chicago in developing a photon counting ASIC which could be used in a future upgrade to VERITAS, but more probable because of the long lead time involved with developing ASICs, in a next generation array. In addition, we have very recently started R&D with the University of Iowa on developing a fast topological upper level trigger. Separately, we are also involved with characterizing SiPMs for particle physics experiments and one possibility is whether these devices could be used in an imaging camera.

In addition to VERITAS, we are involved in writing the White Paper for the next generation of cherenkov experiments. Karen is chairing the technology working group of this paper and is also involved with the Dark Matter working group. Deirdre is involved with the Blazar Science working group and with the Gamma-ray burst working group.

Karen Byrum
(group leader for astroparticles group at ANL)